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EXAMINER

CHEN, QING

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/767,604	Applicant(s) LIANG ET AL.	
	Examiner Qing Chen	Art Unit 2191	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-13 and 19-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-13 and 19-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This Office action is in response to the amendment filed on December 9, 2008.
2. **Claims 9-13 and 19-46** are pending.
3. **Claims 9-13, 29, and 39-41** have been amended.
4. **Claims 1-8 and 14-18** have been canceled.
5. The objection to Claim 29 is withdrawn in view of Applicant's amendments to the claim.
6. The 35 U.S.C. § 112, first paragraph, rejection of Claim 45 is withdrawn in view of Applicant's arguments.
7. The 35 U.S.C. § 112, second paragraph, rejection of Claim 45 is maintained in view of Applicant's arguments and further explained hereinafter.
8. The 35 U.S.C. § 101 rejections of Claims 9-13 are withdrawn in view of Applicant's amendments to the claims.

Response to Amendment

Claim Objections

9. **Claims 9-13 and 39-41** are objected to because of the following informalities:
 - **Claims 9, 11, 40, and 41** recite the limitation "the modem." Applicant is advised to change this limitation to read "the modem device" for the purpose of providing it with proper explicit antecedent basis.
 - **Claims 10, 12, 13, and 39** depend on Claim 9 and, therefore, suffer the same deficiency as Claim 9.Appropriate correction is required.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. **Claim 45** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 45 recites the limitation “the model of the modem comprises an actual hardware component.” The claim is rendered indefinite because if the model of the modem, given the broadest reasonable treatment, is interpreted as a software model of the modem, then it cannot possibly contain any actual hardware components. In the interest of compact prosecution, the Examiner subsequently interprets this limitation as reading “a hardware model of the modem comprises an actual hardware component” for the purpose of further examination.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. **Claims 9-13 and 39-41** are rejected under 35 U.S.C. 102(e) as being anticipated by US **6,823,004 (hereinafter “Abdelilah”)**.

As per **Claim 9**, Abdelilah discloses:

- a first input that operates to receive information from a first device that is utilizing the modem to communicate with a second device through a communication network (*see Column 7: 44-51, “The host system 300 is coupled to the modem 310 through a primary path 315 which supports communication services utilizing the modem 310. More particularly, communications from applications executed on the host system 300 are conveyed on the primary path 315 to the modem 310 for transmission through the port 320 which, in the illustrated embodiment, provides a connection to the Public Switched Telephone Network (PSTN).”*);
- a second input that operates to receive information from the second device through the communication network (*see Column 7: 51-55, “Similarly, communications from a remote device by a server modem (not shown) are received from the PSTN through port 320 and provided to a destination application executing on the host system 300 by the modem 310.”*); and
- a recording module processor communicatively coupled to the first input and the second input that operates to cause input information arriving at one or both of the first input and the second input during real-time operation of the modem to be recorded for subsequent non-real-time analysis (*see Column 9: 66 and 67 to Column 10: 1-5, “... the teachings of the present invention are particularly directed to environments in which both a primary path and a*

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secondary path are available to the DSP memory 345 to provide for monitoring operations to occur in real time while a communication connection is active through the modem.” and 27-49, “Furthermore, as performance information may be collected on a real-time basis during a connection, pertinent data may be preserved which might otherwise be lost as a result of an event causing diagnostic data in the DSP memory 345 to be overwritten (for example, during retrains). The performance data may be recorded while the user of the client modem 310 is actively connected to a remote server modem in a normal manner such as through a service provider end user application (e.g. AOL, IGN Dialer and Windows Dial-up Networking) executing on the host system 300. Performance data may be obtained throughout the active connection operations including both the startup phases and during data communication as well as the disconnect procedures.”).

As per **Claim 10**, the rejection of **Claim 9** is incorporated; and Abdelilah further discloses:

- a command input that receives modem control commands from the first device, and wherein the recording module processor further causes commands arriving at the command input during real-time operation of the modem device to be recorded for subsequent non-real-time analysis (*see Column 9: 33-37, “Performance information so obtained may include a variety of information including ... call setup return codes (CSR CODE) such as those available on Microsoft Corporation's AT code #UD (UniModem diagnostic command specification) ... ”*).

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As per **Claim 11**, the rejection of **Claim 9** is incorporated; and Abdelilah further discloses:

- wherein the first device is a personal computer, and wherein the recording module processor operates to cause the input information arriving at the first input from the personal computer and arriving at the second input from the second device through the communication network, during real-time operation of the modem, to be recorded on a memory device of the personal computer (*see Figure 3: 300; Column 7: 51-55, "Similarly, communications from a remote device by a server modem (not shown) are received from the PSTN through port 320 and provided to a destination application executing on the host system 300 by the modem 310.";* *Column 8: 15-20, "The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein."*).

As per **Claim 12**, the rejection of **Claim 9** is incorporated; and Abdelilah further discloses:

- wherein the recording module processor operates to cause input information arriving at the first input from the first device and arriving at the second input from the second device through the communication network to be communicated to a networked computer communicatively coupled to the modem device over the communication network and recorded on a memory device of the networked computer (*see Column 8: 53-62, "Accordingly, in preferred embodiments of the present invention, modem performance is monitored by a host*

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system 300 containing an internal modem 310. Nonetheless, the benefits of the present invention may also be obtained in various other embodiments including those in which the secondary path 335 does not return to the same host as the primary path 315. A second host may be co-located or remote from the first host. In fact, a remote second host could be at a distant location monitoring a modem connection through the secondary path 335.”).

As per **Claim 13**, the rejection of **Claim 9** is incorporated; and Abdelilah further discloses:

- wherein the modem device comprises an ADSL modem (*see Column 7: 60-63, “Similarly, when connected with a broadband network, the modem 310 may be a cable modem, an Asymmetric Digital Subscriber Line (ADSL) ...”*).

As per **Claim 39**, the rejection of **Claim 11** is incorporated; and Abdelilah further discloses:

- wherein the modem device operates to cause the input information to be recorded on the memory device of the personal computer by, at least in part, being driven as an operating system (OS) device driver of the personal computer to write the input information directly to a hard drive of the personal computer (*see Column 4: 20-24, “One known approach to evaluating modem performance is the use of AT commands, such as those provided for by operating systems, such as Windows™ from Microsoft Corporation, for communicating with a modem (such as the #UD command).”*).

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As per **Claim 40**, the rejection of **Claim 9** is incorporated; and Abdelilah further discloses:

- wherein the recording module processor is integrated into an integrated circuit of the modem (*see Figure 3: 340, 345, 355, and 360*).

As per **Claim 41**, the rejection of **Claim 9** is incorporated; and Abdelilah further discloses:

- wherein the recording module processor operates to cause the input information arriving at the first input and the second input during real-time operation of the modem to be recorded in exactly the same sequence as the input information is received at the modem (*see Column 8: 15-20, "The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein." and 28-33, "... while the secondary path 335 through the bus interface 325 allows the host system 300 to access the DSP memory 345 to obtain data related to performance of the modem 310 during an active communication session supported by the primary path 315 to the modem 310."*).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. **Claims 19-38, 42-44, and 46** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Abdelilah** in view of **US 6,467,052 (hereinafter “Kaler”)**.

As per **Claim 19**, Abdelilah discloses:

- a memory comprising input information that was recorded by a recording module residing on a modem during real-time operation of the modem (*see Column 9: 66 and 67 to Column 10: 1-5, “... the teachings of the present invention are particularly directed to environments in which both a primary path and a secondary path are available to the DSP memory 345 to provide for monitoring operations to occur in real time while a communication connection is active through the modem.” and 27-49, “Furthermore, as performance information may be collected on a real-time basis during a connection, pertinent data may be preserved which might otherwise be lost as a result of an event causing diagnostic data in the DSP memory 345 to be overwritten (for example, during retrains). The performance data may be recorded while the user of the client modem 310 is actively connected to a remote server modem in a normal manner such as through a service provider end user application (e.g. AOL, IGN Dialer and Windows Dial-up Networking) executing on the host system 300. Performance data may be obtained throughout the active connection operations including both the startup phases and during data communication as well as the disconnect procedures.”*).

However, Abdelilah does not disclose:

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- a playback module communicatively coupled to the memory, the playback module comprising a model of the modem that the playback module executes according to the input information in the memory.

Kaler discloses:

- a playback module communicatively coupled to the memory, the playback module comprising a model of an application that the playback module executes according to the input information in the memory (*see Figure 14; Column 33: 15-20, "FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the invention. The user interface features are shown generally by reference number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include a playback module communicatively coupled to the memory, the playback module comprising a model of the modem that the playback module executes according to the input information in the memory. Note that Kaler also discloses that the invention has utility in analyzing the performance of computer hardware (*see Column 3: 58-65*). The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 20**, the rejection of **Claim 19** is incorporated; and Abdelilah further discloses:

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- information from a computer coupled to the modem (*see Column 7: 44-51, "The host system 300 is coupled to the modem 310 through a primary path 315 which supports communication services utilizing the modem 310."*); and
- information from a device with which the computer was communicating through a communication network using the modem (*see Column 7: 51-55, "Similarly, communications from a remote device by a server modem (not shown) are received from the PSTN through port 320 and provided to a destination application executing on the host system 300 by the modem 310."*).

As per **Claim 21**, the rejection of **Claim 19** is incorporated; and Abdelilah further discloses:

- wherein the input information comprises data and modem control commands sent from a computer to the modem (*see Column 9: 33-37, "Performance information so obtained may include a variety of information including ... call setup return codes (CSR CODE) such as those available on Microsoft Corporation's AT code #UD (UniModem diagnostic command specification) ..."*).

As per **Claim 22**, the rejection of **Claim 19** is incorporated; however, Abdelilah does not disclose:

- a debugging module communicatively coupled to the playback module that provides for controlling and observing the operation of the playback module.

Kaler discloses:

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- a debugging module communicatively coupled to the playback module that provides for controlling and observing the operation of the playback module (*see Column 22: 50-67 to Column 23: 1-11, "Like any debugging tool, the VSA should ensure that the debuggability of the system cannot become a security hole. Additionally, VSA debugging is a shared resource in a distributed environment. As such, it is important that proper security precautions be taken to prevent malicious users from obtaining this data."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include a debugging module communicatively coupled to the playback module that provides for controlling and observing the operation of the playback module. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 23**, the rejection of **Claim 19** is incorporated; however, Abdelilah does not disclose:

- wherein the model of the modem comprises a bit-exact software model of the modem that, when executed, produces results that are the same as an original modem that the bit-exact software model is modeling.

Kaler discloses:

- wherein the model of the modem comprises a bit-exact software model of the modem that, when executed, produces results that are the same as an original modem that the bit-exact software model is modeling (*see Column 32: 57-62, "As new diagram elements are identified,*

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they are added to the user's screen 370.”; Column 35: 36-47, “... so that in real time as an application is being analyzed, one block will appear, then another, and then the interconnection between the two blocks. Blocks are dynamically added, removed, and moved, and the interconnections between them are dynamically changed to reflect changing conditions in the execution of the application. The diagram is kept up to date with what is really happening.”).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein the model of the modem comprises a bit-exact software model of the modem that, when executed, produces results that are the same as an original modem that the bit-exact software model is modeling. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 24**, the rejection of **Claim 19** is incorporated; and Abdelilah further discloses:

- a computer communicatively coupled to the modem, and wherein the memory is a memory device of the computer (*see Figure 3: 300, 310, and 315*).

As per **Claim 25**, the rejection of **Claim 24** is incorporated; however, Abdelilah does not disclose:

- wherein the computer comprises the playback module.

Kaler discloses:

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- wherein the computer comprises the playback module (*see Figure 14; Column 33: 15-20, "FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the invention. The user interface features are shown generally by reference number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein the computer comprises the playback module. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 26**, the rejection of **Claim 19** is incorporated; and Abdelilah further discloses:

- a networked computer communicatively coupled to the modem over a computer network, and wherein the networked computer comprises the memory (*see Column 8: 53-62, "Accordingly, in preferred embodiments of the present invention, modem performance is monitored by a host system 300 containing an internal modem 310. Nonetheless, the benefits of the present invention may also be obtained in various other embodiments including those in which the secondary path 335 does not return to the same host as the primary path 315. A second host may be co-located or remote from the first host. In fact, a remote second host could be at a distant location monitoring a modem connection through the secondary path 335."*).

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As per **Claim 27**, Abdelilah discloses:

- operating the modem in real-time to communicatively couple the first device and the second device, the modem comprising a recording module (*see Column 7: 44-51, "The host system 300 is coupled to the modem 310 through a primary path 315 which supports communication services utilizing the modem 310. More particularly, communications from applications executed on the host system 300 are conveyed on the primary path 315 to the modem 310 for transmission through the port 320 which, in the illustrated embodiment, provides a connection to the Public Switched Telephone Network (PSTN)."; Column 8: 15-20, "The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein."* and 28-33, "... while the secondary path 335 through the bus interface 325 allows the host system 300 to access the DSP memory 345 to obtain data related to performance of the modem 310 during an active communication session supported by the primary path 315 to the modem 310."); and

- while operating the modem in real-time, utilizing the recording module to cause the recording of input information input to at least the first and/or second inputs of the modem (*see Column 9: 66 and 67 to Column 10: 1-5, "... the teachings of the present invention are particularly directed to environments in which both a primary path and a secondary path are available to the DSP memory 345 to provide for monitoring operations to occur in real time while a communication connection is active through the modem."* and 27-49, "Furthermore, as performance information may be collected on a real-time basis during a connection, pertinent

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data may be preserved which might otherwise be lost as a result of an event causing diagnostic data in the DSP memory 345 to be overwritten (for example, during retrains). The performance data may be recorded while the user of the client modem 310 is actively connected to a remote server modem in a normal manner such as through a service provider end user application (e.g. AOL, IGN Dialer and Windows Dial-up Networking) executing on the host system 300. Performance data may be obtained throughout the active connection operations including both the startup phases and during data communication as well as the disconnect procedures.”).

However, Abdelilah does not disclose:

- after operating the modem in real-time, executing a model of the modem, where the model is responsive to the recorded input information.

Kaler discloses:

- after operating an application in real-time, executing a model of the application, where the application is responsive to the recorded input information (*see Figure 14; Column 33: 15-20, “FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the invention. The user interface features are shown generally by reference number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application.”).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include after operating the modem in real-time, executing a model of the modem, where the model is responsive to the recorded input information. Note that Kaler also discloses that the invention has utility in analyzing the performance of computer hardware (*see Column 3: 58-65*). The

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modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 28**, the rejection of **Claim 27** is incorporated; and Abdelilah further discloses:

- the first device comprises a personal computer (*see Figure 3: 300*); and
- utilizing the recording module comprises utilizing the recording module to cause the recording of the input information input to at least the first and second inputs of the modem to a memory device of the personal computer (*see Column 8: 15-20, “The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein.” and 28-33, “... while the secondary path 335 through the bus interface 325 allows the host system 300 to access the DSP memory 345 to obtain data related to performance of the modem 310 during an active communication session supported by the primary path 315 to the modem 310.”*).

As per **Claim 29**, the rejection of **Claim 28** is incorporated; and Abdelilah further discloses:

- operating the modem comprises driving the modem as an operating system device driver on the personal computer (*see Column 4: 20-24, “One known approach to evaluating modem performance is the use of AT commands, such as those provided for by operating*

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systems, such as Windows™ from Microsoft Corporation, for communicating with a modem (such as the #UD command).”).

As per **Claim 30**, the rejection of **Claim 27** is incorporated; and Abdelilah further discloses:

- the second device is a computer (*see Column 7: 51-55, “Similarly, communications from a remote device by a server modem (not shown) are received from the PSTN through port 320 and provided to a destination application executing on the host system 300 by the modem 310.”*); and
- utilizing the recording module comprises utilizing the recording module to cause the recording of the input information to a memory device of the computer (*see Column 8: 15-20, “The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein.” and 28-33, “... while the secondary path 335 through the bus interface 325 allows the host system 300 to access the DSP memory 345 to obtain data related to performance of the modem 310 during an active communication session supported by the primary path 315 to the modem 310.”*).

As per **Claim 31**, the rejection of **Claim 30** is incorporated; and Abdelilah further discloses:

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- wherein utilizing the recording module of the modem comprises executing a recording application program on the computer (*see Column 8: 15-20, "The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein."*).

As per **Claim 32**, the rejection of **Claim 27** is incorporated; and Abdelilah further discloses:

- the first device is a personal computer (*see Figure 3: 300*); and

- utilizing the recording module to cause the recording of input information input to at least the first and/or second inputs of the modem comprises utilizing the recording module to cause the recording of input information (*see Column 8: 15-20, "The DSP memory 345 further includes one or more first-in first-out (FIFO) buffers 355, 360. The FIFO buffers 355, 360 implemented in the DSP memory 345 are used to record state transitions made for one or more of the state machines of the modem 310 as will be described further later herein." and 28-33, "... while the secondary path 335 through the bus interface 325 allows the host system 300 to access the DSP memory 345 to obtain data related to performance of the modem 310 during an active communication session supported by the primary path 315 to the modem 310."*)

comprising:

- data input to the first input from the personal computer (*see Column 7: 44-51, "The host system 300 is coupled to the modem 310 through a primary path 315 which supports communication services utilizing the modem 310."*);

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- commands input to a command input of the modem from the personal computer
(see Column 9: 33-37, "Performance information so obtained may include a variety of information including ... call setup return codes (CSR CODE) such as those available on Microsoft Corporation's AT code #UD (UniModem diagnostic command specification) ..."); and
- samples input to the second input from the second device through the communication network *(see Column 7: 51-55, "Similarly, communications from a remote device by a server modem (not shown) are received from the PSTN through port 320 and provided to a destination application executing on the host system 300 by the modem 310.").*

As per **Claim 33**, the rejection of **Claim 27** is incorporated; however, Abdelilah does not disclose:

- wherein executing the model of the modem comprises executing a software model of the modem, and the method further comprises reading the recorded input information into the software model.

Kaler discloses:

- wherein executing the model of the modem comprises executing a software model of the modem, and the method further comprises reading the recorded input information into the software model *(see Figure 14; Column 33: 15-20, "FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the invention. The user interface features are shown generally by reference number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application.").*

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein executing the model of the modem comprises executing a software model of the modem, and the method further comprises reading the recorded input information into the software model. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 34**, the rejection of **Claim 27** is incorporated; however, Abdelilah does not disclose:

- wherein executing the model of the modem comprises executing a bit-exact software model of the modem.

Kaler discloses:

- wherein executing the model of the modem comprises executing a bit-exact software model of the modem (*see Column 32: 57-62, "As new diagram elements are identified, they are added to the user's screen 370."; Column 35: 36-47, "... so that in real time as an application is being analyzed, one block will appear, then another, and then the interconnection between the two blocks. Blocks are dynamically added, removed, and moved, and the interconnections between them are dynamically changed to reflect changing conditions in the execution of the application. The diagram is kept up to date with what is really happening."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include

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wherein executing the model of the modem comprises executing a bit-exact software model of the modem. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 35**, the rejection of **Claim 27** is incorporated; however, Abdelilah does not disclose:

- the model of the modem comprises a software component that is the same as a software component of the modem; and
- executing the model of the modem comprises executing the software component.

Kaler discloses:

- the model of the modem comprises a software component that is the same as a software component of the modem (*see Figure 14; Column 33: 15-20, “FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the invention. The user interface features are shown generally by reference number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application.”*); and
- executing the model of the modem comprises executing the software component (*see Column 35: 36-47, “... so that in real time as an application is being analyzed, one block will appear, then another, and then the interconnection between the two blocks. Blocks are dynamically added, removed, and moved, and the interconnections between them are*

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dynamically changed to reflect changing conditions in the execution of the application. The diagram is kept up to date with what is really happening.”).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include the model of the modem comprises a software component that is the same as a software component of the modem; and executing the model of the modem comprises executing the software component. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 36**, the rejection of **Claim 27** is incorporated; however, Abdelilah does not disclose:

- the model of the modem comprises a hardware component that is the same as a hardware component of the modem; and
- executing the model of the modem comprises utilizing the hardware component.

Kaler discloses:

- the model of the modem comprises a hardware component that is the same as a hardware component of the modem (*see Figure 14; Column 3: 58-65, “While the invention has utility in analyzing the performance of a software application that is executing on a distributed data processing system, its utility is not limited to such, and it has utility in analyzing the performance of computer hardware ...”; Column 33: 15-20, “FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the*

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invention. The user interface features are shown generally by reference number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application.”); and

- executing the model of the modem comprises utilizing the hardware component (*see Column 35: 36-47, “... so that in real time as an application is being analyzed, one block will appear, then another, and then the interconnection between the two blocks. Blocks are dynamically added, removed, and moved, and the interconnections between them are dynamically changed to reflect changing conditions in the execution of the application. The diagram is kept up to date with what is really happening.”).*

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include the model of the modem comprises a hardware component that is the same as a hardware component of the modem; and executing the model of the modem comprises utilizing the hardware component. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 37**, the rejection of **Claim 27** is incorporated; however, Abdelilah does not disclose:

- debugging operation of the modem by, at least in part, observing execution of the model with the recorded input information in non-real-time.

Kaler discloses:

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- debugging operation of the modem by, at least in part, observing execution of the model with the recorded input information in non-real-time (*see Column 22: 50-67 to Column 23: 1-11, "Like any debugging tool, the VSA should ensure that the debuggability of the system cannot become a security hole. Additionally, VSA debugging is a shared resource in a distributed environment. As such, it is important that proper security precautions be taken to prevent malicious users from obtaining this data."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include debugging operation of the modem by, at least in part, observing execution of the model with the recorded input information in non-real-time. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 38**, the rejection of **Claim 27** is incorporated; and Abdelilah further discloses:

- wherein the modem comprises an ADSL modem (*see Column 7: 60-63, "Similarly, when connected with a broadband network, the modem 310 may be a cable modem, an Asymmetric Digital Subscriber Line (ADSL) ..."*).

As per **Claim 42**, the rejection of **Claim 19** is incorporated; however, Abdelilah does not disclose:

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- wherein the model of the modem comprises a bit-exact software model of the modem that exactly mimics the real-time operation of the modem.

Kaler discloses:

- wherein the model of the modem comprises a bit-exact software model of the modem that exactly mimics the real-time operation of the modem (*see Column 32: 57-62, "As new diagram elements are identified, they are added to the user's screen 370."; Column 35: 36-47, "... so that in real time as an application is being analyzed, one block will appear, then another, and then the interconnection between the two blocks. Blocks are dynamically added, removed, and moved, and the interconnections between them are dynamically changed to reflect changing conditions in the execution of the application. The diagram is kept up to date with what is really happening."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein the model of the modem comprises a bit-exact software model of the modem that exactly mimics the real-time operation of the modem. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 43**, the rejection of **Claim 19** is incorporated; however, Abdelilah does not disclose:

- wherein the playback module comprises playback software that, when executed by a processor, causes the reading of the input information into the model of the modem.

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Kaler discloses:

- wherein the playback module comprises playback software that, when executed by a processor, causes the reading of the input information into the model of the modem (*see Column 34: 5-9, "Using the VCR paradigm to control the depiction of the application performance, the VSA can run through each of the events and correspondingly animate the application model shown in FIG. 13 or FIG. 14."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein the playback module comprises playback software that, when executed by a processor, causes the reading of the input information into the model of the modem. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 44**, the rejection of **Claim 19** is incorporated; however, Abdelilah does not disclose:

- wherein the model of the modem comprises a software component that is the same as a software component of the modem being modeled.

Kaler discloses:

- wherein the model of the modem comprises a software component that is the same as a software component of the modem being modeled (*see Figure 14; Column 33: 15-20, "FIG. 14 illustrates various user interface features of an animated application model in an exemplary embodiment of the invention. The user interface features are shown generally by reference*

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number 400. In the UI depicted in FIG. 14, diagrams are portrayed of the different blocks representing varying levels of detail of a hierarchical model of the application.”).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein the model of the modem comprises a software component that is the same as a software component of the modem being modeled. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

As per **Claim 46**, the rejection of **Claim 19** is incorporated; however, Abdelilah does not disclose:

- wherein the playback module comprises playback software comprising a bit-exact model of the operation of the modem, such that any modem behaviors that occurred in real-time operation during the period of time over which the input information was obtained will recur during execution of the playback software in the non-real-time playback environment.

Kaler discloses:

- wherein the playback module comprises playback software comprising a bit-exact model of the operation of the modem, such that any modem behaviors that occurred in real-time operation during the period of time over which the input information was obtained will recur during execution of the playback software in the non-real-time playback environment (*see Column 32: 57-62, “As new diagram elements are identified, they are added to the user's screen 370.”; Column 33: 28-31, “... users can play and replay the application execution, stop, pause,*

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reverse, speed up, slow down, and so forth.”; Column 35: 36-47, “In addition, all of the above windows can be operated to display the application performance in real time as well as “post mortem”. ... so that in real time as an application is being analyzed, one block will appear, then another, and then the interconnection between the two blocks. Blocks are dynamically added, removed, and moved, and the interconnections between them are dynamically changed to reflect changing conditions in the execution of the application. The diagram is kept up to date with what is really happening.”).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kaler into the teaching of Abdelilah to include wherein the playback module comprises playback software comprising a bit-exact model of the operation of the modem, such that any modem behaviors that occurred in real-time operation during the period of time over which the input information was obtained will recur during execution of the playback software in the non-real-time playback environment. The modification would be obvious because one of ordinary skill in the art would be motivated to observe and isolate undesirable modem performance and behavior (*see Kaler – Column 1: 33-36*).

16. **Claim 45** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Abdelilah** in view of **Kaler** as applied to Claim 19 above, and further in view of **US 5,353,243 (hereinafter “Read”)**.

As per **Claim 45**, the rejection of **Claim 19** is incorporated; however, Abdelilah and Kaler do not disclose:

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- wherein a hardware model of the modem comprises an actual hardware component that is the same as a hardware component of the modem being modeled.

Read discloses:

- wherein a hardware model of a device comprises an actual hardware component that is the same as a hardware component of the device being modeled (*see Column 4: 32-50, "The HMS of the present invention provides hardware models of standard ICs, ASICs, and electronic subsystems. The HMS has a number of applications. Some of the major ones are as follows: ..."*).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Read into the teaching of Abdelilah to include wherein a hardware model of the modem comprises an actual hardware component that is the same as a hardware component of the modem being modeled. The modification would be obvious because one of ordinary skill in the art would be motivated to verify both logic and timing behavior of a modem (*see Read – Column 1: 21-31*).

Response to Arguments

17. Applicant's arguments filed on December 9, 2008 have been fully considered, but they are not persuasive.

In the Remarks, Applicant argues:

a) The Applicant notes that contrary to the non-final Office Action's assertion, a model of a modem can contain actual hardware components. As mentioned above, the Applicant's

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specification clearly supports hardware modeling components of the actual modem being modeled. (Applicant's Specification, Page 10, Lines 12-14). The Applicant agrees that a model of a modem contains modeled versions of the actual components of the modem. However, the Applicant notes that such modeled versions can clearly be actual hardware models of hardware as opposed to software models of hardware. In other words, although hardware is being modeled, the model itself may contain actual hardware as opposed to software. As mentioned above, the term "actual" was used to clarify that the model of the modem comprising the hardware component is an actual hardware model as opposed to a software model of a hardware component.

Examiner's response:

a) Examiner disagrees. With respect to the Applicant's assertion that a model of a modem can contain actual hardware components, the Examiner respectfully submits that only a hardware model of the modem may contain actual hardware components. In contrast, the plain language of the claim does not require the model of the modem to be a hardware model. The claim merely recites a model of the modem and thus, the claim is not limited to the scope of a hardware model of the modem. Applicant is reminded that in order for such limitations to be considered, the claim language requires to specifically recite such limitations in the claim, otherwise broadest reasonable interpretations of the broadly claimed limitations are deemed to be proper.

Therefore, for at least the reason set forth above, the rejection made under 35 U.S.C. § 112, second paragraph, with respect to Claim 45 is proper and therefore, maintained.

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In the Remarks, Applicant argues:

b) Clearly, common sense dictates that a communication device (i.e., hardware) receiving input data 107 and input samples 105 would do so at a structural component of the communication device (i.e., hardware). Thus, it is nonsensical to interpret "a first input that operates to receive information..." and "a second input that operates to receive information..." as anything other than a structural component of the modem device being claimed. Further, the non-final Office Action has failed to show where in the Applicant's specification the "first input" and "second input" is defined as software.

Examiner's response:

b) Examiner disagrees. Applicant's arguments are not persuasive for at least the following reasons:

First, with respect to the Applicant's assertion that it is nonsensical to interpret "a first input that operates to receive information ..." and "a second input that operates to receive information ..." as anything other than structural components, as previously pointed out in the Non-Final Rejection (mailed on 06/09/2008) and further clarified hereinafter, the Examiner respectfully submits that the specification defines a modem as "a communication device or program that enables a personal computer (PC) to transmit data over, for example, cable or telephone lines (emphasis added)" (*see page 7, paragraph [18]*). Thus, if the claimed modem is interpreted, given the broadest reasonable treatment, as a software modem, then the claimed features of a "first input," a "second input," and a "recording module" must be software

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components of the software modem. As the Applicant is likely aware, a software program cannot possibly contain any hardware elements.

Second, with respect to the Applicant's assertion that the Non-Final Rejection (mailed on 06/09/2008) has failed to show where in the Applicant's specification that the "first input" and "second input" are defined as software, the Examiner respectfully submits that the Applicant's original drawings and specification only disclose input samples and input data (*see Figure 1: 105 and 107; page 8, paragraph [20]*). In fact, Applicant's original drawings and specification do not explicitly disclose input structures of the communication device. Paragraph [20] of the Applicant's specification discloses, at most, receiving input samples and input data. Thus, the input structures of the communication device are only implicitly disclosed. Since the Applicant has failed to explicitly disclose input structures of the communication device, the claimed features of a "first input" and a "second input" of a software modem are given the broadest reasonable treatment and thus, are interpreted as software components that receive the input samples/data.

Therefore, for at least the reasons set forth above, the rejections made under 35 U.S.C. § 101 with respect to Claims 9-13 were proper and are withdrawn in view of Applicant's amendments to the claims.

In the Remarks, Applicant argues:

c) The non-final Office Action cites to Abdelilah's Column 8, Lines 15-20 and 28-30; Column 9, Line 66 to Column 10, Line 5; and Column 13, Lines 32-42 as allegedly disclosing "a recording module processor communicatively coupled to the first input and the second input that

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operates to cause input information arriving at one or both of the first input and the second input during real-time operation of the modem to be recorded for subsequent non-real time analysis."

However, Abdelilah's disclosure of recording state transitions made for one or more of the state machines of the modems is different than recording input information arriving at one or both of the first input and the second input. The Applicant notes that the state transitions are not input information. Instead, the state transitions are internal state changes made by the state machines internal to the modem. (Abdelilah, Column 8, Line 64).

Examiner's response:

c) Examiner disagrees. With respect to the Applicant's assertion that the state transitions of Abdelilah are not input information, the Examiner respectfully submits that Abdelilah clearly discloses "input information arriving at one or both of the first input and the second input" (*see Column 9: 66 and 67 to Column 10: 1-5, "... the teachings of the present invention are particularly directed to environments in which both a primary path and a secondary path are available to the DSP memory 345 to provide for monitoring operations to occur in real time while a communication connection is active through the modem."* and 27-49, "Furthermore, as performance information may be collected on a real-time basis during a connection, pertinent data may be preserved which might otherwise be lost as a result of an event causing diagnostic data in the DSP memory 345 to be overwritten (for example, during retrains). The performance data may be recorded while the user of the client modem 310 is actively connected to a remote server modem in a normal manner such as through a service provider end user application (e.g. AOL, IGN Dialer and Windows Dial-up Networking) executing on the host system 300.

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Performance data may be obtained throughout the active connection operations including both the startup phases and during data communication as well as the disconnect procedures."). Note that performance data (input information) may be recorded by the DSP memory while the client modem is actively connected to the host system (arriving at the first input).

Therefore, for at least the reason set forth above, the rejections made under 35 U.S.C. § 102(e) with respect to Claim 9 and 35 U.S.C. § 103(a) with respect to Claims 19 and 27 are proper and therefore, maintained.

In the Remarks, Applicant argues:

d) Further, throughout Abdelilah's disclosure, Abdelilah teaches using the DSP 340 to process and store in DSP memory 345: diagnostic data, data related to modem performance, internal state information, etc. (See e.g., Abdelilah, Abstract, Column 4, Lines 62-64, Column 5, Lines 14 and 24-30, Column 8, Lines 16-19, 30-31 and 63-66, Column 9, Lines 1-4, 10-11 and 33-43). However, nowhere in Abdelilah is there any disclosure regarding recording the actual input information received at one or both of the first input and the second input. Rather, Abdelilah only discloses monitoring select types of information. (Abdelilah, Column 10, Lines 6-7). Thus, because Abdelilah merely discloses processing and storing select data related to diagnostics, performance and internal states, Abdelilah fails to disclose "a recording module processor communicatively coupled to the first input and the second input that operates to cause input information arriving at one or both of the first input and the second input during real-time operation of the modem to be recorded for subsequent non-real time analysis," as recited by the Applicant in independent claim 9.

Examiner's response:

d) Examiner disagrees. With respect to the Applicant's assertion that nowhere in Abdelilah is there any disclosure regarding recording the actual input information received at one or both of the first input and the second input, the Examiner respectfully submits that the Examiner has addressed the Applicant's arguments in the Examiner's response (c) hereinabove.

Therefore, for at least the reason set forth above, the rejections made under 35 U.S.C. § 102(e) with respect to Claim 9 and 35 U.S.C. § 103(a) with respect to Claims 19 and 27 are proper and therefore, maintained.

Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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19. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Qing Chen whose telephone number is 571-270-1071. The Examiner can normally be reached on Monday through Thursday from 7:30 AM to 4:00 PM. The Examiner can also be reached on alternate Fridays.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Wei Zhen, can be reached on 571-272-3708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Q. C./

Examiner, Art Unit 2191

/Wei Y Zhen/

Supervisory Patent Examiner, Art Unit 2191